<u>Claims</u>

What is claimed is:

1.   A method for dynamic rules-based peg counting comprising:

    (a)   at a plurality of signaling message site collectors, generating

5   peg counter instances by comparing monitored signaling

         messages to existing peg counter definitions, each peg counter

         instance including an accumulator value indicating a number of

         the signaling messages that match one of the existing peg

         counter definitions and an identifier for identifying the

10   associated peg counter definition;

    (b)   receiving new peg counter definitions; and

    (c)   in response to receiving the new peg counter definitions,

         switching to the new peg counter definitions on the fly and

         generating peg counter instances based on the new peg

15   counter definitions.

2.   The method of claim 1 wherein generating peg counter instances

    includes:

    (a)   determining whether a monitored signaling message matches

         one of the peg counter definitions;

20   (b)   in response to determining that a monitored signaling message

         matches one of the peg counter definitions, determining

         whether a peg counter instance exists for the matching peg

         counter definition; and

(c)   in response to determining that a peg counter instance exists, incrementing an accumulator value associated with the peg counter instance.

3.   The method of claim 2 comprising, in response to determining that a peg counter instance does not exist, creating a new peg counter instance for the matching peg counter definition and incrementing an accumulator value associated with the peg counter instance.

4.   The method of claim 2 wherein determining whether a peg counter instance exists includes determining a peg counter identifier corresponding to the matching peg counter definition and searching for a peg counter instance having the peg counter identifier.

5.   The method of claim 1 wherein the peg counter definitions include rules for generating peg counter instances based on SS7 messages.

6.   The method of claim 1 wherein the peg counter definitions include rules for generating peg counter instances based on Internet Engineering Task Force SIGTRAN signaling messages.

7.   The method of claim 1 wherein the peg counter definitions include rules for generating peg counter instances based on IP telephony signaling messages.

8.   The method of claim 1 comprising creating the new peg counter definitions using a rules-based language.

9.   The method of claim 8 wherein creating the new peg counter definitions using a rules-based language includes presenting a user

with lists of messages and message parameters and receiving input from the user regarding messages, message parameters, and values for the message parameters.

10. The method of claim 9 wherein creating the new peg counter definitions using a rules-based language includes presenting the user with comparator choices for comparing the message parameters to the message parameter values to create message parameter comparison equations and presenting the user with logical operators for combining the message parameter comparison equations and thereby creating a peg counter definition.

11. The method of claim 1 wherein receiving the new peg counter definitions includes:

(a) writing the new peg counter definitions to a database at an administration server;

(b) downloading the peg counter definitions to databases at the site collectors;

(c) notifying the site collectors of a change in their respective databases; and

(d) at the site collectors, in response to receiving the notification, loading the new peg counter definitions into program memory.

12. The method of claim 1 wherein switching to the new peg counter definitions on the fly includes switching to the new peg counter

definitions without modifying or re-compiling computer code executing on the site collectors for generating the peg counter instances.

13. The method of claim 1 comprising transmitting the peg counter instances from the site collectors to a data gateway server.

5 14. The method of claim 13 comprising, at the data gateway server, aggregating the peg counter instances from the site collectors to form system wide peg counter instances.

15. The method of claim 14 wherein aggregating the peg counter instances includes:

10   (a) receiving a first peg counter instance from a first site collector, the first peg counter instance having a first peg counter identifier, a first timestamp, and a first accumulator value;

    (b) searching for a peg counter instance having the first peg counter identifier and the first timestamp; and

15   (c) in response to locating a peg counter instance having the first peg counter identifier and the first timestamp, adding the first accumulator value to an accumulator value associated with the peg counter instance.

16. The method of claim 15 comprising, in response to failing to locate a
20 peg counter instance having the first peg counter identifier and the first timestamp, storing the first peg counter instance as a new peg counter instance in a peg counter database.

17.   A system for dynamic rules-based peg counting, the system comprising:

(a)   a plurality of site collectors for receiving signaling messages and for generating peg counter instances based on the signaling messages matching existing peg counter definitions, the peg counter instances each including an accumulator value indicating a number of signaling messages matching one of the peg counter definitions and an identifier for identifying the associated peg counter definition; and

(b)   an administration server operatively associated with the site collectors for receiving new peg counter definitions from a user and for communicating the new peg counter definitions to the site collectors, wherein, in response to receiving the new peg counter definitions, the site collectors are adapted to switch to the new peg counter definitions on the fly and to generate peg counter instances based on the new peg counter definitions.

18.   The system of claim 17 wherein the site collectors are adapted to generate peg counter instances based on SS7 signaling messages sent over SS7 signaling links.

19.   The system of claim 17 wherein the site collectors are adapted to generate peg counter instances based on Internet Engineering Task Force SIGTRAN signaling messages sent over IP signaling links.

20. The system of claim 17 wherein the site collectors are adapted to generate peg counter instances based on IP telephony signaling messages sent over IP signaling links.

21. The system of claim 17 wherein the site collectors are adapted to receive the signaling messages from signaling link probes.

22. The system of claim 17 wherein the site collectors are adapted to receive the signaling messages form message copy functions internal to a signaling node.

23. The system of claim 17 wherein the administration server is adapted to provide a rules-based language to the user for creating the peg counter definitions.

24. The system of claim 23 wherein the rules-based language includes message type identifiers, message parameter identifiers, comparators for creating message parameter comparison equations, and logical operators for combining the message parameter comparison equations.

25. The system of claim 17 wherein the administration server is adapted to download the new peg counter definitions to the site collectors and notify the site collectors of the presence of the new peg counter definitions.

26. The system of claim 17 comprising a data gateway server operatively associated with the site collectors and a plurality of applications,

wherein the site collectors are adapted to upload the peg counter instances to the data gateway server at predetermined intervals.

27. The system of claim 26 wherein the data gateway server is adapted to aggregate the peg counter instances received from the site collectors and to generate application-specific peg counter instances in response to application-specific peg counter requests.

28. A computer program product comprising computer executable instructions embodied in a computer readable medium for performing steps comprising:

(a) presenting the user with a computer based graphical template for defining a peg counter;

(b) receiving input from the user via the template regarding parameter values to be extracted from received signaling messages;

(c) receiving input from the user via the template regarding values to be compared with the extracted parameter values;

(d) receiving input from the user via the template regarding equations for comparing the extracted parameter values to the values specified in step (c) ; and

(e) receiving input from the user via the template regarding logical operators for combining equations to form a definition for the peg counter.

29.   The computer program product of claim 28 wherein presenting the user with a computer based graphical template for defining a peg counter includes presenting the user with a computer based graphical template including menus for selecting the parameters and logical operators.

30.   The computer program product of claim 28 wherein receiving input from the user regarding parameter values to be extracted from received messages includes presenting the user with a menu of parameter names corresponding to a message type for the peg counter and allowing the user to select parameter names from the list.

31.   The computer program product of claim 28 wherein receiving input from the user regarding parameter values to be compared with the extracted parameter values includes presenting the user with an input field for allowing the user to input parameter values.

32.   The computer program product of claim 28 wherein receiving input from the user regarding parameter values to be compared with the extracted parameter values includes presenting the user with a menu of parameter value lists and receiving input from the user regarding one of the parameter value lists.

33.   The computer program product of claim 28 wherein receiving input from the user regarding equations includes presenting the user with a menu of comparators and allowing the user to select comparators from the menu.

34. The computer program product of claim 28 wherein receiving input from the user regarding logical operators includes presenting the user with a menu including AND-based and OR-based operators and receiving input from the user regarding operators for combining the equations.

35. The computer program product of claim 28 comprising storing the peg counter definition in a database.

36. The computer program product of claim 28 comprising distributing the peg counter definition from an administration server to a plurality of network monitoring site collectors.

37. The computer program product of claim 36 comprising notifying the site collectors of the peg counter definition.